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NOTICES OF The Aëronautical Society of Great Britain.

FORTHCOMING ARRANGEMENTS.

The opening meeting of the Forty-second Session of the Aëronautical Society of Great Britain will be held at the Society of Arts, John Street, Adelphi, in December next, the date of which will be duly announced. Amongst the papers read at this meeting will be "The Use of the Kite in Meteorological Research," by Dr. William Napier Shaw, Sc.D., F.R.S., M. Aër. Soc., Director of the Meteorological Office. "The Gordon Bennett International Balloon Race," by Colonel J. E. Capper, R.E., C.B., M. Aër. Soc. (with cinematograph), and "The Stability of the Conic Shape in Kites and Flying Machines," by Mr. Reginald M. Balston, M. Aër. Soc.

The second meeting of the Session will be held in March, and amongst the papers will be "The Carrying Power of Aëroplanes," by Mr. José Weiss, M. Aër. Soc., and "An Electric Signalling Kite," by Eric Stuart Bruce, M.A.

KITE DISPLAY.

It has been arranged to hold a kite display at a convenient distance from the Metropolis at the Summer Meeting of the Aëronautical Society of Great Britain. Further particulars will be announced in January next.

THE LIBRARY.

The following publications have been presented to the Library:—

By Major B. Baden-Powell, The Account of the Flying Machine (National Review), by Major B. Baden-Powell. By Mr. E. A. Barry, Tableau d'Aviation, by E. Dieuaide, and various numbers of old Annual Reports of the Aëronautical Society of Great Britain.

Members of the Aëronautical Society of Great Britain who, by any accident, postal or otherwise, may not receive their copy of the Journal and notices of meetings are requested to communicate with the Honorary Secretary as speedily as possible in each case, so that full investigation as to the cause may immediately be made.

ERIC STUART BRUCE,
Honorary Secretary.

The Gordon Bennett International Balloon Race.

1.—The Competitors and the Result.

By a MEMBER OF THE PARIS AËRO CLUB.

No fewer than seven nations tried to win the Gordon Bennett Cup in the race which started from the Tuileries Gardens, in Paris, on September 30th. But the wind was in an unfavourable direction for the accomplishment of a long distance record. To some, the English Channel barred the way, to some, the North Sea.

The cup offered for the greatest distance covered has been accorded to the American aëronaut, Mr. Frank P. Lahm, who descended 15 miles north of Scarborough.

It will be seen in another part of this Journal that in December next, Members of the Aëronautical Society of Great Britain will hear an account of the Gordon-Bennett race from Colonel J. E. Capper, who took part in the race, having accompanied Mr. Rolls in the "Britannia." In this account, therefore, it will suffice to merely tabulate the competitors and results.

The following table, compiled from the official programme of the Paris Aëro Club and other sources, gives the list of competitors, their assistants, place of descent, and other details of interest.

Order of Departure.	Name of Pilot.	Name of Balloon.	Capacity in Cubic Mètres.	Nationality.	Name of Assistant.	Place of Descent.
1	M. Alfred Vonwiller	L'Elfe ..	1,850	Italy ..	Lt. E. Gianetti	New Holland, near Hull.
2	M. Hugo von Abercron	Düsseldorf	2,250	Germany	M. O. Erbsloh	Villers-sur-Mer.
3	Comte Henri de la Vaulx	Valhalla ..	2,250	France ..	Cte. Hadelin d'Oultremont	Walsingham, Norfolk.
4	M. Emilio Herrera	Ay-Ay-Ay ..	2,250	Spain ..	—	Cabourg, France.
5	Hon. Chas. S. Rolls	The Britannia	2,200	Great Britain	Col. Capper	Near Sandringham, Norfolk.
6	M. Alberto Santos Dumont	Les Deux Amériques	2,150	South America	—	Broglie, France.
7	M. Van den Driessche	Ojouki ..	2,200	Belgium ..	M. L. Capazza	Bretigny, France.
8	M. Scherle ..	Schwaben	1,500	Germany	Dr. Schmeck	Near Dieppe, France.
9	Comte de Castillon de Saint Victor	Le Foehn ..	2,250	France ..	M. E. Zens	Blonville, sur-Mer, France.
10	M. E. G. de Salamanca	Norte ..	2,250	Spain ..	M. Montojo	Blonville-sur-Mer.
11	Mr. Frank H. Butler	City of London	2,200	Great Britain	Mr. Griffith Brewer	Blonville-sur-Mer.
12	Mr. Frank P. Lahm	United States	2,080	United States	Major Hersey	Near Scarborough.
13	Baron von Hewald	Pommern..	2,200	Germany	Dr. Steyrer	Condé-sur-Mer.
14	M. Jacques Balsan	Ville de Châteauroux	2,250	France ..	—	Singleton, Sussex.
15	M. Kindelan y Duani	Montana ..	2,250	Spain ..	M. de la Horga	Near Chichester.
16	Professor A. K. Huntingdon	Zephyr ..	2,200	Great Britain	Mr. C. F. Pollock	Sittingbourne, Kent.

The following is the official order of the results of the race issued by the Paris Aëro Club:—

1.—Mr. Frank P. Lahm (distance, 647 kilomètres 098 mètres).
2.—M. Alfred Vonwiller.
3.—Hon. C. S. Rolls.
4.—Comte Henri de la Vaulx.
5.—M. Kindelan y Duani.
6.—M. Jacques Balsan.
7.—Professor A. K. Huntingdon.
8.—M. E. Herrera.
9.—M. H. von Abercron.
10.—Comte de Castillon de Saint Victor.
11.—Mr. F. H. Butler.

12.—Mr. E. G. de Salamanca.
13.—Baron von Hewald.
14.—M. A. Santos Dumont.
15.—M. Van den Driessche.
16.—M. Scherle.

2.—Some Technical Features of the Competing Balloons.

By MAJOR B. BADEN-POWELL, F.R.A.S.

There was no great novelty about any of the balloons. They were all spherical, with the exception of the "City of London," which is pear-shaped. Nearly all had ripping cords attached, and most of them (but none of the English balloons) had small awnings over the valves. This latter arrangement may be most necessary in a long voyage, as if the balloon is exposed to rain quite a pool of water would collect over the valve, and if the balloon then ascends to a considerable height, this water may freeze, and, even though it did not prevent the valve opening, might render it useless by preventing the egress of gas. Several of the foreign balloons had valves of a rather peculiar pattern. Instead of having two equal semicircular doors, they had but one door, covering, perhaps, three-quarters of the disc of the valve. The advantage of this is not very apparent. One balloon, No. 14, had a ballonet in the lower part, capable of being filled with air by means of a fan blower fixed outside the car, to be worked by hand. M. Santos Dumont had a heavy and complicated arrangement to support a six h.p. petrol engine, and two vertically acting screw propellers. This apparatus was said to weigh 400 pounds, and, as far as one could judge, it did not have any great effect on the lift of the balloon, though this was difficult to judge of, as the motor only worked for perhaps half-a-minute.

3.—The Britannia.*

By The HON. CHARLES S. ROLLS.

The following are the principal details concerning my balloon, the "Britannia," which I used in the Gordon-Bennett Race: (The balloon was constructed for me by Messrs. Short Brothers. It has a capacity of 78,500 cubic feet, and is made of a special material, and varnished with a new kind of varnish, which has got over the difficulty of heat generation when the balloon is packed up new. It is a very great advantage, having this new kind of varnish, as on the trial trip of the balloon from Messrs. Short's balloon ground last month, the balloon was left packed up for a considerable time, yet, when opened out, it was found perfectly cold. The valve is of the French type, made by Messrs. Short. The suspension hoop is a new kind of their design. The car is also British, and very comfortably fitted for long distance work. The lining is of a special fabric which enables the car to float in water with two passengers. The ballast is all carried outside the car, so as to leave the interior clear. There is a special anchor, which can be taken to pieces, and the bits used for ballast if necessary, and the trail rope is made of cocoanut fibre, in order to float. We found this useful on the sea, for when crossing the Channel we could not have made the English coast except by keeping very low with the end of the trail rope on the surface of the sea.

A very complete electric light installation was fitted up by the Portable Electric Light Company, so that all the instruments, etc., could be read during the night as in daylight.

* This balloon, it will be seen in the above, table has obtained the first place amongst the British competitors and was placed third in order.

The Retirement of Colonel Templer.

All those who are aware of the efficient public services Colonel Templer has for so many years rendered to the military balloon factory at Aldershot will have received the news of his retirement with regret, a regret that is, however, mitigated by the belief that occasions will often arise when it will be necessary for the Government to consult so eminent an authority in aërial matters, and thus avail itself of a skill and experience not easy to replace.

Before Colonel Templer became connected with military aëronautics, in 1878, very little had been done towards its development. An aëronautical committee was constituted in 1871, but though it had been proposed to use the balloon in the Ashantee War, the project was abandoned on account

of the weight that the transport would involve.

It may be of interest to record a few of the developments in military ballooning in this country since Colonel Templer was connected with the department. It was Colonel Templer who first showed the superiority of goldbeaters' skin for forming the envelope of a balloon. It will be remembered that the advantages of goldbeaters' skin, such as its lightness, impermeability, and strength were very fully stated in the article "The Balloon at the Front," which appeared in this journal in January, 1900.

Since that article was written the capacity for retaining the gas was put to severe test in the exigencies of the Boer War, and more than justified the expectations of experts.

In Colonel Templer's reply to questions asked him at a meeting of the Aëronautical Society of Great Britain, and which will be found published in this journal, October, 1901, he stated that at Fourteen Streams one balloon was worked 13 days right off with one load of gas, and by its means the British were enabled to prevent the Boers from relieving Fourteen Streams. To those uninitiated in the management of balloons 13 days may sound a short time, but those who have experienced the comparatively short life of the lifting power of one charge of gas in an ordinary balloon made of varnished cambric will appreciate the records of duration of lifting power accomplished by the goldbeaters' skin balloons in South Africa. Added to the example given by Colonel Templer is the testimony of Major Jones, who stated in his note read before the Aëronautical Society of Great Britain, and published in October, 1902, that the balloon Bristol was kept going without refilling for 22 days at one station, doing a march of 165 miles with the division.

If Colonel Templer's work in connection with the balloon department had only been the development of a balloon fabric so well suited to the exigencies of war, he would on that account alone have deserved the gratitude of the nation.

But in many other ways his practicability has been manifested. The system of filling the balloons with hydrogen gas compressed in steel cylinders rendered it possible to inflate the balloons both quickly and conveniently. To obtain the fittest in all details of the equipment has been Colonel Templer's earnest desire. That was probably why an attempt was made to obtain a purer hydrogen than can be made from zinc and sulphuric acid and the plant was installed at Aldershot by Messrs. Siemens for obtaining pure hydrogen by electrolysis.

The balloon equipments that have been sent out in connection with campaigns during Colonel Templer's time of service are as follows:—

In 1884 there was a balloon corps sent out with Sir Charles Warren's Bechuanaland Expedition. It included three balloons.*

In 1885 three balloons were sent to the Soudan under the command of Colonel Templer. In 1899 the balloons were sent out to the South African War. In the course of this war no less than four sections were despatched. In the summer of 1900 another section was sent to China.

In the remarks made by Colonel Templer before the Aëronautical Society of Great Britain concerning the use of the balloon in South Africa it will be remembered that allusion was made to the admirable work done during the war by one so long associated with Colonel Templer, and whose retirement has not so very long preceded his own. It was to Colonel Trollope that the grave and responsible task of sending out the various balloons to the seat of war was entrusted, and, as Colonel Templer pointed out, though Colonel Trollope had so great a strain cast on him by the exigencies of the Boer War, even that did not exhaust his resources, and he was able to send a balloon section to China, and yet another to the jubilee in Australia to celebrate the anniversary. Eminent public service in critical moments is too apt to be forgotten by the generation which has benefited by them, but the officer who, in the daily routine of the balloon factory at Aldershot, achieved such excellent results will figure in the history of military ballooning.

Colonel Templer's successor as superintendent of the balloon factory at Aldershot is Colonel J. E. Capper, and it is a matter for congratulation that the Government have been able to secure the services of one who appears so well fitted to carry on the work of his predecessor. He is keen on progress, and though he has to deal largely with balloons, he knows their limitations, and that even for observation purposes they are

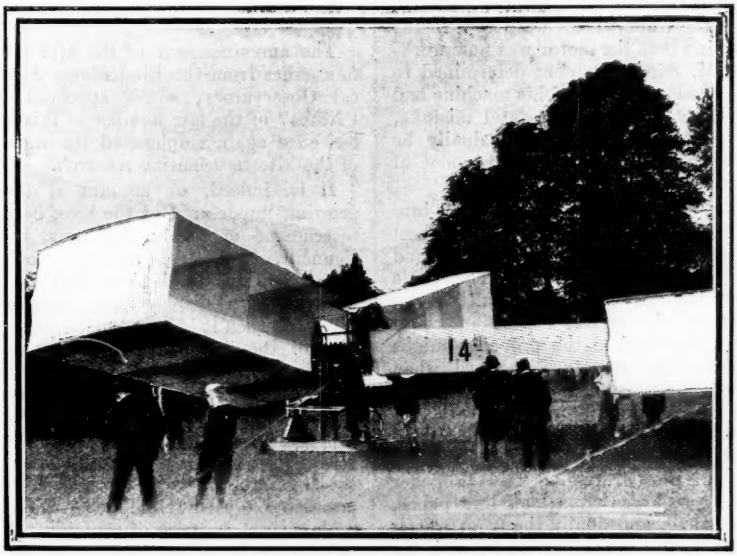
* Aëronautical Journal, April, 1900, page 126.

not all sufficient. It is through Colonel Capper's enterprise that experiments have recently been made with man-lifting kites at Aldershot, with the view of supplementing the balloons and affording a means of reconnoitring when those winds which are prohibitive to captive balloon elevation are blowing.

Colonel Capper is watching keenly the experiments that are being made with motor-driven aëroplanes, a system which may sooner than expected afford a mobile means of aërial scouting and render tethered balloons and tethered kites unnecessary.

M. Santos Dumont's new flying machine, which he calls "The Bird of Prey," consists of two box kites held together by a peg. In the centre is the motor with the screw close behind. The helm is fairly far forward. The length of the machine is ten metres, the wing spread 12 metres. The total surface area is 80 square metres. The weight is 160 kilogrammes.

On the occasion of the first trial the machine was lifted by one of M. Santos Dumont's elongated balloons, but he very soon dispensed with this impediment, mounting the machine on three wheels so



M. SANTOS DUMONT'S MOTOR-DRIVEN AËROPLANE.

With kind permission of the Editor of the "Graphic" and the Topical Press Agency.

M. Santos Dumont's Motor-Driven Aëroplane.

By A Member of the Paris Aëro Club.

The accompanying illustration of M. Santos Dumont's new motor-driven aëroplane shows very clearly that modern aspirants in navigating the air by bodies heavier than air are arriving at simplicity of construction. This is, no doubt, an all-important step towards success, and its absence in so many of the earlier schemes was a hindrance to progress.

that it could run upon the ground until sufficient power is got up to lift it from the ground.

This lifting has been actually realised. On the first occasion the lift was only a few inches, but when M. Santos Dumont tried for the Archdeacon prize on September 13 last it is stated that the rear wheel was raised to the height of a man, and that the distance traversed was 11 metres. The *New York Herald* thus describes the attempt to win the prize:—

"The atmospheric conditions yesterday morning at seven o'clock were perfect. Not a breath of wind disturbed the leaves of the

trees. A warm sun had taken the chill off the early morning. The Bird of Prey was wheeled out to Bagatelle, followed by an enormous crowd, and stationed at one end of the huge field. A few minutes later the motor was in motion, and almost immediately the machine began to rush to the farther end of the field. The speed achieved was not, however, sufficient to force it into the air. The front wheels left the ground for a moment, but the boundary was reached before flight could be attained.

"A quarter of an hour went by, during which time the motor was regulated. A fresh start was made in the opposite direction, and within 10 yards of the point of departure the front wheels were high in the air. Feeling that the motor was now working well, M. Santos Dumont determined to raise the head or rudder of his machine and attempt flight. He made a fatal mistake. Instead of raising the head gradually he turned upward with a brisk movement of the lever. The result was disastrous.

"Instantly the Bird of Prey shot up into the air almost vertically, the rear wheel left the ground to the height of a man, and then the accident happened. The angle taken by the machine was such that no alteration of the rudder's position could affect it. Powerful as the propeller might be to drive the structure forward when horizontal, it proved insufficient to support the whole weight of it from beneath. A rearward movement quickly manifested itself, and like a flash the Bird of Prey fell heavily to the ground. The propeller struck first and was ripped off like paper, then the frame, and finally the front wheels smote the earth, crumpling up beneath the force of the blow and leaving the machine a helpless wreck.

"M. Santos Dumont was unhurt. For a moment spectators feared that the machine would fall over backwards and crush the hardy aëronaut beneath its mass. Fortunately the angle taken was not sufficiently great and he escaped with nothing more than a bump."

Having traversed 15 of the 25 metres necessary for winning the Archdeacon prize, it is not unlikely that M. Santos Dumont will still carry off the prize. In repairing the delapidated machine some alterations will be made in the position of the propeller, which will be placed nearer the centre of the machine so that in case of a fall there will be less risk of it being snapped off.

The experiment of September 13 showed what has not been doubted since Sir Hiram Maxim made his great aëroplane flying machine years ago, that a screw will raise and drive through the air an aëroplane; but it has also shown that the stability of the motor-driven aëroplane is still a matter of uncertainty.

The Development of the Kite and the Forthcoming Kite Display.

The announcement of the kite ascent of four miles from the Lindenburg Aëronautical Observatory, which appeared in the "Notes" of the last number of this journal, has once again emphasised the importance of the kite in scientific research.

It is, indeed, on account of the daily growing importance of the kite, both as an instrument of science and war, that the Council of the Aëronautical Society of Great Britain decided to hold an International kite display near London next summer, when it is hoped many of the members of the Aëronautical Society of Great Britain and their friends will bring forward their recent work in connection with the development of the kite. It may also be expected that the display will stimulate others who in their youth flew kites as toys to once more return to the practice of their childhood, though now with earnest purpose of evolving the fittest type, either for lifting meteorological instruments to the greatest possible heights, or with the patriotic motive of raising as steadily and safely as possible aërial scouts in the nation's future wars. There is, too, a further incentive to those who evolve new forms of scientific kites, in the thought that they are helping on the advent not merely of the investigation of the air, but its navigation. For the kite is at the basis of the flying machine in which the motor takes the place of the string. Some of those who begin with kite flying will end in the construction of motor-driven aëroplanes.

Those who have not hitherto studied deeply the scientific aspects of kite flying will find much literature of usefulness in certain past numbers of this journal. For the convenience of those who may wish to consult this literature a list of some of the

articles and notes that have appeared is here appended:—

April, 1897.—Man-Lifting War Kites. The Cellular Kite, by L. Hargrave. Note on Kites for Meteorological Investigations.

October, 1897.—Note on Lamson's Man-Lifting Kite.

January, 1898.—Note on the Highest Kite Ascent. Note on Kites and Atmospheric Electricity.

April, 1898.—Kites: Their Theory and Practice, by Major B. Baden-Powell. Note on the Blue Hill Meteorological Kite Observatory.

July, 1898.—Wise's Photographic Kite. A New Form of Kite, by C. Zimmerman.

October, 1898.—The Kite Equipment of the Arlington Observatory. The Highest Kite Record.

January, 1899.—War Kites, by Major Baden-Powell. Nickels' Registering Kite. Some Kite Records in the United States, by W. A. Eddy. Lamson's New Kite. Progress in the Exploration of the Air with Kites at the Blue Hill Observatory, by A. Lawrence Rotch.

April, 1899.—Note on Kite Apparatus at Russian Manœuvres. Hargrave's Soaring Kites. Note on Kite Flying Record.

July, 1899.—Note on Kite Experiment on War-ship.

October, 1899.—Note on Kites for Meteorology.

July, 1900.—Note on the Descent of a French Balloon and Kite in England.

October, 1900.—The Recent High Kite Ascents at the Blue Hill Observatory, by A. Lawrence Rotch.

January, 1901.—Note on the French Kite which fell in England.

April, 1901.—Note on Kite Flying Records.

July, 1901.—Note on Remarkable Kite Flight.

October, 1901.—The Chief Scientific Uses of Kites, by A. Lawrence Rotch. Rotary Kites, by P. Y. Alexander. The Systematic Exploration of the Atmosphere by means of Kites.

April, 1903.—The Kite Equipment of the Scottish National Antarctic Expedition, by John Anderson.

January, 1904.—Report of the International Kite Competition.

April, 1904.—Scientific Kite Flying.

July, 1904.—M. Teisserenc de Bort's Kite Flying Experiments. Experiments with Man-Lifting Kites at Aldershot. Balloons and Kites in the War in the East.

January, 1905.—Kites and Kite Flying and Aeroplanes by W. Dines, F.R.S.

July, 1905.—Letters on The Rigidity of Kites, by (1) Lawrence Hargrave; (2) W. H. Dines. Note on Experiments with Man-Lifting Kites at Aldershot.

April, 1906.—Note on The Use of Balloons in Wireless Telegraphy.

July, 1906.—Across-Channel Communication by Kite, by S. H. R. Salmon. Note: Cyclonic Observations by Balloons and Kites. The Kite Ascent of Four Miles.

Those who peruse the articles which deal specially with the scientific uses of the kite will perceive that the principal form of kite selected for scientific work has been the Hargrave box kite. It seems, however, a question whether it is not advantageous at times to vary the form of kite with the nature of the wind. Is the same type of kite equally well adapted for light breezes and stiff winds? This is a question asked by those who watched the behaviour of certain kites in the competition organised by the Aëronautical Society of Great Britain in 1903. Those who had previously witnessed flights of Mr. Cody's bat-winged box kite predicted that his kite would take an easy lead in the upward race. But it was not so. The highest flight was attained by quite a different form of kite, the Brogden six-winged kite. From the moment it started it became apparent that this form of kite was specially suitable for such a very light wind as prevailed over the Sussex downs on the afternoon of the competition. Had there been a strong wind it is highly probable that the more substantial Cody kite would have taken the first place.

These are points which can only be settled by comparative experiments under a variety of conditions, but they are likely to be elucidated by such events as the forthcoming kite display.

Apart from the use of the kite in the interests of scientific research, there is a fascination in kite flying in itself sufficient to create a new national sport, one most fitting for our wind-blown islands.

At the present moment the subject of public school education and public school recreation is being much criticised. The older methods are found wanting. Why not take the opportunity of discontent to institute a new sport into public school life like that of kite flying, one that will be invigorating alike for mind and body, for it is one in which the intellectual powers are not dormant. To some such a suggestion may seem impractical, but it may be mentioned these remarks are suggested by a correspondence the writer lately had with the headmaster of one of our leading public schools.

Beneficial results to science might ensue from the training of the school boy in kite flying. It would be too ideal to expect all school boys to fly their kites for the object of scientific research, but it may with reason be imagined that the more scientific-minded of the boys and those who are being educated in various branches of natural science would see in the kites opportunities for observation and experiment. Possibly the formation of school scientific kite societies might result, and thus might be accumulated useful evidence both aëronautical and meteorological.

In the course of this article it has already been prophesied that we shall pass from kite to flying machine. The band of workers in this country at the motor-driven aëroplane is as yet a small one, but it is existent. If the forthcoming kite display adds to its numbers two or three earnest workers it will not be held in vain.

Rules for the Aëronautical Challenge—Cup "Marguerite de Savoie."

Translated by HELEN AUXILIUM BRUCE.

1.—The object of the aëronautical competition "Marguerite de Savoie" is to cross the Alps by manned aërostats in accordance with the following rules:—

The Italian Aëronautical Society, who is organising the competition, has been appointed guardian of the prize cup by Her Majesty the Queen Mother Marguerite of Savoy. The prize is a cup most artistically designed from the instructions of the Royal giver.

2.—All sorts of aërostats may take part, and the competition will take place yearly between May 1 and October 31. Each competitor may choose his own day and hour for his attempt, notice being given at least 24 hours in advance to the Italian Aëronautical Society, and the place of starting indicated. Each competitor on entering his name shall pay 200 francs (£10) to the central bureau of the Society at Rome, half of which will be refunded to him at the moment of starting.

3.—Each aëronaut shall compete under the auspices of a society recognised by the International Aëronautical Federation. He shall cross the Alps by passing over the line of the division of the watershed to north and south. The starting point and landing point shall be at not less than 50 kilometres from this line, and shall be measured on "l'arc du grand cercle terrestre," passing through the starting point and the landing point.

4.—The zone of the Alps to be crossed is bounded on the west by the Col de l'Argentera and on the east by the Col de Tarvis. As long as the Italian Aëronautical Society is keeper of the cup the starts shall be from Italian soil within the limits defined by Article 3.

5.—That competitor shall be declared winner of the cup who shall have made the longest journey in excess of the minimum defined by Article 3 measured on "l'arc du grand cercle terrestre," and passing through the starting and landing point. The winner of the challenge cup shall receive 5,000 francs himself and the Aëronautical Society he represents shall become keeper of the cup. That Society shall then assume the responsibility of organising the next year's competition with the same object, to cross the Alps, and with the same rules as this year, only excepting the zone of departure, the choice of which shall remain with that society which is the keeper of the cup.

6.—Each competitor may try as often as he likes within the time limits fixed by Article 2, and he shall decide himself by which of his ascensions he shall be judged.

7.—That society which wins the cup three years running, or which keeps it five years because of a lack of competitors, shall then become its definite owner.

8.—Each society and each competitor shall undertake to abide by these rules.

General President,
DR. FILIPPO DE FILIPPI.

Special Supplementary Article to the Rules of 1906.

SPECIAL ARTICLE.

For this year of 1906 during the Milan Exhibition the aëronautical cup "Marguerite de Savoie" competition will be merged with the competition of the same name organised by the committee of the

Exhibition, whose object is also the crossing of the Alps.

The entrance fee for this year, therefore, will be only 20 francs, repayable at the moment of starting, and the starting point will be the balloon park of the Exhibition.

The committee of the Exhibition, in addition to the other facilities offered in its rules relating to carriage of material, free gas, etc., undertakes to pay return fare to Milan and carriage of apparatus.

Information as to state of atmosphere and the weather forecasts of the Meteorological Office will be daily posted up in the balloon park for the benefit of competitors.

All the other rules not affected by this special article remain fixed for the competition.

Wings versus Aëroplanes.

By R. F. MOORE, R.E., M. Aër. Soc.

There are two mechanical arrangements, heavier than air, which have been proposed for obtaining flight, namely, wings and aëroplanes. The latter is the one chiefly in favour with the public as there have been more or less successful experiments brought to its notice. There are, however, many advantages for a machine made with wings in imitation of a bird or flying fox as in Nature.

Wings with their large spread and slow motion give more effective action on the air than the small blades of a screw propeller. It is known from experiment that a large surface working slowly is more efficient than a small one working rapidly in a rarefied medium such as air, for the same power expended.

Wings when they move forward edgeways do so on to fresh, undisturbed air, and do not create a vacuum like a screw propeller in the direction of its motion.

With efficient wings we are able to reduce the size and weight of the whole flying machine, so that one large enough to aviate one man driven by wings would be far less cumbersome in size and weight than an aëroplane driven by a screw propeller.

The action for flapping the wings is an up-and-down stroke, which would simplify the motive engine and lead to a further economy in size and weight. A machine driven by wings would be safer than one driven by a screw propeller, for if anything went wrong with the wings from which the propulsive power emanates they would necessarily cease to drive the machine forward, whereas the screw propeller might go on working, though the supporting aëroplane may be damaged or out of adjustment. Wings would cease automatically to flap if not at the right angle with the vertical.

To summarise, we have with wings:—

1. Greater efficiency.
2. Less size and weight.
3. Less danger.

The wings need not be feathered ones, as may be seen by the wings of the flying fox, which have a framework covered with a membrane. Experiments have been made with both feathered and membrane wings, and promising practical results obtained, as may be seen by those published in the Aëronautical Society's Journal, Vol. I., No. 4, and Vol. IX., No. 35, and other places.

Lighter and more efficient motor engines are being made every day, so there should be no difficulty in now obtaining one suitable. It is only a question of persevering with the experiments already made and obtaining money and means for this purpose.

The Kingdom of the Air.

The increasing popularity of ballooning as a sport has raised the question of the proprietorship of the air, and it has been asked whether a balloon has a legal right to float over an owner's grounds or house? The opinion has even been expressed that the air above a landowner's grounds is his property as far as the air goes. These ideas have been of late vexing the balloonists, who are aware that they cannot indulge the new sport without passing over considerable house and land property. Their minds will, however, probably for the moment be put at rest by the decision of the Institute of International Law at Ghent as to the freedom of the air.

That Institute lately discussed the regulations to be applied to aëronautics and wireless telegraphy, and the following articles were adopted:—

(1) The air is free. The only rights that States have in it, in peace and war time, are such as are necessary to their perservation; (2) in the absence of special circumstances

the rules applicable to correspondence by ordinary telegraphy shall be applicable to wireless telegraphy; (3) each State shall have the faculty, so far as is necessary for its safety, to oppose the passage of Hertzian waves over its territory and territorial waters, whether such waves emanate from State apparatus or private apparatus, placed on land, on a ship, or on a balloon; and (4) in the event of correspondence by wireless telegraphy being prohibited, the Government shall at once warn other Governments of the fact.

But though the Institute of International Law at Ghent has quickly dismissed the question, a little reflection shows that the freedom of the air is likely to raise some perplexing questions when the problem of aërial navigation has been completely solved. If air is free and no nation and no corporation can inflict laws upon those who navigate it, will adventurers on flying machines enter the air above private grounds and skim the ground a foot high with impunity of being trespassers, on the plea that the air is theirs? More definitions as to the freedom of the air than the Ghent conference suggests will one day have to be invented, and flight in the future, like all other doings of man, must inevitably be subject to laws; but, at any rate, the day has not yet come when legislation would be desirable, and the balloonist is still practically free.

The Wellman Balloon Expedition to the North Pole.

The Wellman Balloon Expedition to the North Pole has wisely been abandoned for this year, as the tests made with the machinery of the airship at Spitzbergen were far from satisfactory.

It appears that the motors proved too powerful for the fragile car of the airship. It is said that during the trial the strong motion of the propellers shook the car into such an intensity of vibration that the aëronaut who was testing them could hardly keep his balance. The experiment of removing one of the motors was made, but without producing the required effect.

It is inconceivable why such defects of construction should not have been remedied in Paris without it being necessary to transfer the balloon to Spitzbergen to discover them; but, at any rate, considering the evident faults of construction, it is infinitely more satisfactory to hear that the balloon has been sent back to Paris for reconstruction than that it had started for the North Pole.

The following was the message received in Hammerfest from Mr. Wellman, and dated August 28, in reference to the abandonment of his project for this year:—

"I have decided not to attempt the voyage to the Pole this year on account of defects in the mechanical equipment of my airship. According to the announcement made last winter in anticipation of such possibilities, the expedition will continue next year. The party is now completing a great balloon house and other features of the plant, and is making experiments with a view to the campaign in 1907. This year is one of preparation, and next year will be one of action.

"Our confidence in success next year is increased by this summer's work, and by weather observations. The motors work well, and the airship is in good condition, but the car and mechanic's equipment will be entirely rebuilt in Paris during the winter. The expedition will arrive here next May, and will find everything ready, whereas this year the whole summer was consumed in building plant. I return to Europe in the middle of September, leaving a small party of men here to guard our headquarters."

The New American Aëro-Club.

Captain Homer W. Hedge, the President of the American Aëro Club, founded in New York on October 14, 1905, has lately contributed some interesting facts to the *New York Herald* concerning the organisation over which he presides. Perhaps one of the most striking facts is the statement that two years ago there were not half-a-dozen airworthy balloons in the State. To-day there are over one hundred. The new club already boasts of three hundred members, and at least 75 of them own balloons. So great is the demand for balloons created by the new club that in the Ninth Avenue a balloon factory is running day and night, and cannot keep pace with its orders. The Aëro Club of America is, like older aëro clubs, an offshoot of automobilism. Most of its organisers are men who are active and ardent members of the Automobile Club.

The New York Club is the first one of its kind in America, and it is the only one that has membership in the International League of Aëro Clubs. Several other aëro clubs have, however, started in other American centres since its foundation, and Boston, Philadelphia, Brooklyn, and Washington can now each boast of a similar institution.

The New York Club proposes to shortly build new premises, and to erect at some convenient spot outside the city a large building where balloons and airships can be stored. This building is to be constructed of sufficient size to receive inflated balloons for which balloonists may seek shelter for the night without the necessity of having to empty the balloon of gas. This is an excellent enterprise, and one which may well be imitated by other nations.

Some interesting aëronautical events in connection with the American Aëro Club are promised for the near future. An interesting series of balloon ascents have been arranged to take place in Massachusetts this autumn, and it is expected that the famous French aëronaut, Comte Henri de la Vaulx, will take part in these ascents. It has been decided that these ascents are to take place from Lennox and its neighbourhood.

At Pittsfield, near Lennox, extensive, and it is claimed ideal, arrangements have been made for gas inflation. Another coming event announced is the aëronautical exhibition to be held in connection with the Jamestown Exhibition next summer, and which will be organised by the Aëro Club of America.

REVIEWS.

Military Ballooning.

Lecture delivered at the Royal United Service Institution by COLONEL J. E. CAPPER, C.B., R.E.—*Journal of the Royal United Service Institution*, July, 1906.—J. J. KELIHER & Co.

The lecture recently delivered by Colonel J. E. Capper, at the Royal United Service Institution, contains much valuable information concerning a subject about which much has not been hitherto publicly known. It also contains many suggestions for the more thorough use of the captive observation balloon in war.

Colonel Capper lays stress on the necessity for trained observation. He points out that though recent improvements in the stability of the balloon have been made, so that ordinary powerful glasses can be used, still much practice is required to get useful observations. "The natural feeling of insecurity, the slight motion which moves the field glasses, the strangeness of one's surroundings, and the outlook, and the tendency to look too close below one instead of far afield, all militate against the value of the novice's reports, more especially with our service balloons, which are advisedly kept so small that usually only one man can ascend at a time to any considerable height, so that the novice would have to go up alone."

Until a number of officers of the general staff are trained to observe from balloons, the work of observing falls on the balloon officer. That his observations may be of value, he must have knowledge of the situation. He should, therefore, be in the closest touch with the intelligence branch of the army. Of great importance is the organisation of a rapid system of transmitting intelligence between the observer and the headquarters staff. The best system is telegraphy, supplemented by signals in case of breakdown.

Speaking of the physical defects of captive balloons, Colonel Capper points out that high winds are their greatest enemy, not only making them unsteady, and the use of glasses difficult, but also preventing the balloon rising to a sufficient height. There is also a twisting motion of a captive balloon which is hampering in the location of points, and makes orientation difficult.

The German Government, by the way of obviating these difficulties, have adopted an elongated balloon, rigged like a kite. In calm weather the lifting power of the gas takes it up like an ordinary balloon, but in wind the balloon is kept head on to the wind, which, striking on the under surface, lifts it like a kite.

Some have wondered why experiments with this kite form of balloon have not been tried by the British balloon experts. To these, Colonel Capper's statements as to the objections against its use will be of interest. "It requires to handle it a detachment three or more times as large as the one we require, while the transport

required to put a single balloon in the air is twice that of ours. Moreover, from experiments I have seen, I should judge that in a high wind, should any one of the numerous ropes comprising the rigging, be cut by shell fire, or break, the violent death of the aëronaut would be almost a matter of certainty."

Speaking of the French observation balloons, Colonel Capper mentions that these are larger than ours, and have the car suspended from a trapeze some distance below the balloon. Though these arrangements prevent the swinging of the car, it renders access to the balloon itself difficult. The car of the British balloon is very close beneath it, so that access to the balloon is easy. It is steadied by rope attachments from the top and sides of the balloon to the cable.

A few words are said as to the very modern use of man-lifting kites for supplementing the captive balloon in winds too strong for the balloon. "The kites we have tried give very satisfactory results, the car remaining comparatively steady at heights up to 1,500 feet. On the few occasions on which ascents have been made to greater heights (the record is just under 3,000 feet, by Lieutenant Broke Smith, R.E.), the observer reported the car too unsteady for observation. With the adoption of a perfected apparatus, and further experience, we may hope to be able to guarantee observation from the air on any day on which the visual condition of the atmosphere permits of it."

Perhaps the most important portion of Colonel Capper's address is that which deals with the tactics of the captive balloon. The balloon has two distinct uses. (1) The obtainment of information. (2) The infliction of damage on the enemy by directing the fire of artillery on objects invisible from the ground.

There is a third possible use in exerting an indirect moral effect in preventing attempts at turning movements and the massing of troops for surprise attacks, where such movements and masses are invisible from the ground held, though visible from the balloon.

As to the obtainment of information, in flat, open country movements of considerable bodies have been distinguished as far as 15 miles, but at this distance the nature of the bodies cannot be distinguished; in fact, single batteries, squadrons, or battalions in close formation cannot be distinguished over 4 to 6 miles, even under such good conditions as a fairly open and undulating country. Even then artillery may be confused with wheeled transport. Batteries coming into action can often be seen and guns counted at over 5 miles, mounted troops in open formation at 3 to 4 miles,

When a balloon is empty, the transport of the one waggon containing it and the and infantry in open formation at 2 to 3 miles.
three waggons containing the cylinders of compressed gas for filling it, can be moved with fair rapidity over ordinary ground. It is when the balloon is full that its moving is impeded either by having to move it against the wind or by having to make detours to avoid roads with trees on either side.

This difficulty of transporting filled balloons in military operations can be endorsed by the writer of this review, who, in the course of some experiments conducted for the Government, was called upon to convey a filled balloon some miles in a blizzard, a task by no means easy. There can be no doubt that it is desirable to leave the filling of the balloon as late as possible.

The next point discussed is the position of a balloon company. The normal position would be with the advance guard, kept ready to fill until the advance was stopped by the enemy.

"A balloon pushed well to the front or to a flank, filled under cover and allowed to ascend rapidly, might ascertain in a few minutes whether the enemy were present in force or whether they could safely be brushed aside. Even if the balloon had at once to be deflated, the information would be well worth the transport of three waggons of gas. In such circumstances, the balloon must be very boldly used; the detachment would presumably be concealed, whilst a balloon rising rapidly to a considerable height is a very difficult mark for artillery and the punctures caused by even a considerable number of rifle bullets would not affect its capacity to stay in the air for the short time necessary to make the observation."

In the attack of a position, the balloon has at first to locate the enemy's trenches, the position of his artillery, reserves, and massed cavalry. If a map of the ground exists the balloon can at once be boldly pushed up as close as is practicable to the

enemy's outlying infantry. If, however, there are no maps, the balloon should be kept well back while a sketch or map can be made from the balloon in comparative security.

In the case of the defence of a position, Colonel Capper would put up the balloons at a very early stage. "They need not give the position away, as they can be put up behind it or on the flanks, or in front, being withdrawn as the enemy comes closer."

The site chosen for the ascent must depend on circumstances. He must consider rapid means of withdrawing both for his balloon and detachment. If there is a wind blowing from the enemy towards his line, he can neglect the nature of the country between him and his lines, and go away with his balloon free, landing near some defined place within the protected area. But if the wind blows away from the defended area, the balloon must be brought back attached to the waggon, or by hand. Freedom from obstacles on the return route must largely influence the choice of locality of ascent.

Very ably does Colonel Capper describe the important use of a captive balloon in directing artillery fire. "Though no exact method of ranging from a balloon has yet been evolved, a line can very easily be given from the balloon to a battery, and this line can be given with great accuracy and considerable rapidity. The balloon ascends close to, and behind the position where the guns are to come into action, and the observer looks about for a likely target, say, the enemy's artillery or masses of troops hidden behind folds in the ground. He then aligns two men stationed on the ground below him, by signalling to them with different coloured flags, until similar flags, which they hold, are aligned on the target. With a practised observer, and men used to the work, a line with an average error of less than 1 degree can be given in about three minutes. If maps are available he can give the approximate range, and if not he must estimate it. The guns can be brought up under cover and laid on the lines so given. The balloon is connected up with the battery commander by telephone, and, by reporting approximately the distance under or over of each ranging shot fired, the target can generally be reached at from the 5th or 7th round, when fire can be made as rapidly as desired. . . . That the assistance which can be given to artillery by aerial observation is valuable cannot be doubted. The battery is enabled to fire from behind cover, and so very effectively, whilst it will be placed at a great advantage in engaging guns also firing from the rear slopes of hills or similar situations in that its fire can be almost, if not quite, as accurate as if it were firing direct, whilst the enemy's fire must depend for its effect largely on chance." The above quoted remarks of Colonel Capper suffice to show that if direction of artillery fire was the only use to which the balloon can be applied in war, that use would alone justify the expenditure of the British Government on the service of the air.

The remarks concerning the use of ordinary free balloons in war are of interest. Their use appears limited, but, as experience during the siege of Paris showed, they are useful to a beleaguered city as a means of escape and for carrying despatches, and in specially favourable circumstances might be used to communicate again into a fortress of considerable area where the enemy only occupies a band of country around it.

As to reconnaissance with free balloons, Colonel Capper states that it has been suggested that where an invader lands, a free balloon reconnaissance might with advantage be made across his line of advance, but he does not support this view. "It would be necessary to go about 20 miles per hour, and stay up from 2,000 to 3,000 feet, and I find that in these circumstances, it is wonderful how little one sees of troops on the ground except on main roads nearly directly underneath. If you imagine yourself trying to reconnoitre a position whilst moving in front of it on a motor car at 20 miles an hour, you can imagine some of the difficulties."

But perhaps of still more interest at the present moment are Colonel Capper's remarks concerning the possible use of dirigible balloons.

He thinks the dirigible balloon is a problem that will have to be faced in the next great war. The Lebaudy airship, which has travelled forty miles in 2½ hours, and for which a speed of twenty-five miles an hour is claimed, has proved the possibilities of return journeys for airships in light winds, but the present limitation of distance would seem to disqualify them for general scouting purposes, though they may prove, even in their present imperfect state,

useful for short excursions as for reconnaissance of or from a position, or for use from or against a fortress. They are, however, described as excessively vulnerable, as when punctured they lose their shape, and it is only by retaining their shape they can make headway against the resistance of air.

Colonel Capper then passes to the consideration of flying machines, and by his optimistic remarks on this head, showed his belief in the future conquest of the air by the body heavier than air. "There is another and far more important phase of aerial locomotion, which in the near future may probably have to be reckoned with, and that is the propelled aëroplane or motor-driven kite.

"Valuable experiments are being made in this direction in many parts of the world, and some I know have met with such success that in a few years we may expect to see men moving swiftly through the air on simple surfaces, just as a gliding bird moves. Over 20 miles at one flight has been already covered by one such machine, and though at first the machine will be small and the operator so taken up in looking after the management of it that he will have no time to look about him, in time his movements to control it will become instinctive, and he will make a useful scout, whilst later larger machines will be built and passengers will be carried who can devote all their attention to observation or to offensive operations, and then a new phase of war will be brought into being.

"Such machines will move very rapidly, probably never less than 20 and up to 100 miles per hour; nothing but the heaviest storms will stop them. They will be small and difficult to hit, and very difficult to damage, and their range of operations will be very large, partly owing to their great pace and ability to move actually as the crow flies, and partly because they will be able to carry fuel sufficient for long journeys, the power required to drive them at high velocities being comparatively small."

Notes.

Professor Graham Bell's Wireless Motor Aeroplane.—Through the ingenuity of Professor Graham Bell, the ascent of an aëroplane, whose motor is driven by energy supplied from the earth without wires, is an achievement. The *New York Herald* recently stated that by means of Professor Graham Bell's invention Captain Anglemire, an aëronaut, rose to 200 feet, described a circle, and alighted safely within a few feet of the starting point.

In this new application of wireless energy there would seem to be great possibilities, and it is hoped that further news may be forthcoming. In connection with the experiment it may be noted that M. Santos Dumont recently hinted to a correspondent of the *Daily Mail* that Professor Graham Bell's experiment is not absolutely original. Force, he said, had already been transmitted from a dynamo placed on the ground to a motor on a flying machine of sufficient power to raise it from the ground, and that an experiment of this kind was recently carried out at Monaco.

M. Archdeacon's Screw Propeller Bicycle.—In order to test various forms of screw propellers and determine which is best suited for airships and aëroplanes, M. Archdeacon has invented his screw propeller bicycle. The machine is driven through friction with the air instead of friction with the ground as on other automobiles. A special frame allows the rider to sit very far back from the front wheel. A horizontal shaft, placed above the handle-bars, carries the propeller, which is mounted ahead of the front wheel. The rider controls the steering as on an ordinary bicycle. In the tests made the machine started with smoothness and celerity, and it is stated in the *Daily Mail* that a speed of 48 miles an hour has been attained by the machine near Paris. As the propeller, however, raised clouds of dust, the novel bicycle is not likely to be used except for the purely experimental purpose of testing screws for aërial machines.

The Balloon Journey of the Brothers Wegener.—Some interesting details of the balloon journey of the brothers Wegener, of the German Aëronautical Observatory at Lindenburg, were recently published in *Nature*. The balloon, of 36,000 cubic feet capacity, started from Berlin at 9 a.m. on April 7, six-and-a-half miles from east of Aschaffenburg. The distance traversed during the journey was 900 miles. The Baltic Sea and Jutland were crossed twice, once travelling north, and again on the return journey. Astronomical observations were used to determine the route by night, and visual and photographic observations the route by day. The various altitudes at which the journey was performed were as follows:—During the day of April 5 1,200 metres, on the night of April 5-6 up to 2,900 metres. From mid-day to sunset of the same day 300 metres to 100 metres, during the next night from 100 metres to 1,000 metres, except when the balloon was in the vicinity of Hamburg, where the balloon was taken to a height of 2,900 metres. The

greatest altitude was on April 7, when the balloon reached 3,700 metres. The lowest temperature record was 16°C.

The Duties of Balloon Pilots in Aëronautical Contests.—The *New York Herald* in September last made interesting reference to an article on balloon contests. It has been generally supposed that in balloon contests the balloons are entirely at the mercy of the wind, and that the aëronauts on board are powerless to exercise any control over their movements. But it is pointed out in the article that though the chief factor in a balloon race is the speed and force of the wind, still very much depends on the skill and experience of the pilot, and especially from his comprehension of the physical changes in the atmosphere. Though the aëronaut cannot directly control the horizontal movements of the balloon, he can affect its vertical direction upwards and downwards by throwing out ballast and letting out gas. The art of ordinary balloon steering is in throwing out ballast and letting out gas. In so doing the pilot gives proof of all his skill and experience, and brings all his meteorological knowledge to bear. The secret lies in the choice of the right moment to carry out either of these operations. To economise the ballast is of the greatest importance, as when that is exhausted the voyage must terminate. Gas is, of course, only expended when it is absolutely unavoidable to do so.

A balloon pilot should be able to detect a falling motion of his balloon at once. A downward movement is easily checked if noted at once, but if allowed to continue it may necessitate a great sacrifice of ballast. In noting the falling of a balloon the usual instruments, barometer and barograph, do not invariably suffice, as they do not move with sufficient rapidity, and the downward movement is well under way before they begin to record it. For this reason a special apparatus to register downward movement was invented. "A light feather is suspended by a fine silk thread from the end of a stick. As long as the balloon is going up or remaining steady this hangs downward, but the moment a downward movement takes place the feather rises towards the stick. The aëronaut can, therefore, take steps to check the downward movement the instant it begins." But wind currents often move in wave-like manner. Under such circumstances a balloon rises and falls without any necessity of sacrifice of either gas or ballast. The utilisation of these currents should be well considered by the balloon pilot.

The Aëronautical Challenge Cup "Marguerite de Savoie."—The attention of British balloonists is called to the rules for the Aëronautical Challenge Cup "Marguerite de Savoie," which appear translated in another part of this journal. It will be noticed that special facilities are given to competitors for this year by the committee of the Milan Exhibiton, the entrance fee, to be refunded at starting, being only 20 francs. The committee also generously undertake to pay return fare of balloonists to Milan, and carriage of apparatus. It is to be hoped that some British aëronauts may feel tempted to take advantage of the liberal offer of the committee of the Milan Exhibition.

A High-Speed Balloon Voyage Across the Channel 20 Years Ago.—The *Field* has lately called attention to a sportive balloon voyage across the Channel 20 years ago, in which the Channel was crossed in 12 minutes. At that time ballooning was first taken up as a sport in this country by Sir Claude De Crespigny and some other enterprising sportsmen, and their efforts foreshadowed the modern aëro clubs. On the occasion of the ascent to which reference had been made, Sir Claude de Crespigny and his sister were to have ascended with Mr. Simmons, the aëronaut, with a view of crossing the Channel, but as the wind was blowing strongly the lady withdrew from the venture. When the order to let go was given to the man holding the line, those on one side failed to respond, and the car was jammed against the wall. An unfortunate spectator had his ribs broken, and Sir Claude de Crespigny was tilted out of the car, breaking his leg in two places. The balloon, being relieved of one of the occupants of the car, shot up into the air with its only occupant, Mr. Simmons, and travelled with tremendous force over the estuary of the Thames, cutting over the eastern corner of Thanet, on past Deal, across the Channel. As has before been stated, the journey took only 12 minutes from coast to coast. The balloon descended near Arras, Mr. Simmons, to his regret, cutting the journey short because Sir Claude de Crespigny was the purse bearer, and had, by accident, been left behind; otherwise, Mr. Simmons might have made a record distance journey in the hurricane.

Foreign Aëronautical Publications.

(In this list a selection of some of the more notable articles is only given.)

L'AÉRONAUTE (Paris).

July, 1906.—Graffond et Extenseur (C. Chavoutier). Projet d'Aérostat Dirigéable (Dumas Père et Fils).

August.—Poissons Volants (Janson). Pour l'Aviation et l'Aérostation Dirigéable (J.

Leloup). La Fête du Soleil (C. Chavoutier). Les Cerfs Volants Militaires au XIme. Siècle (J. L.). Le Bombardement Aérostatique de Venise en 1849 (M. de Fonvielle).

September. — Cerf-Volant Paragrèle (J. Leloup).

AÉROPHILE (Paris).

July, 1906.—Portraits d'Aéronautes Contemporains—René Gasnier (A. de Masfrand). Le Dirigéable de la Vaulx (A. de Masfrand). L'Aéroplane Santos Dumont (Marius Degoul). Les Concours Aéronautiques de Milan (A. Clery). La Fête des Ballons à Bruxelles (Georges Bans).

September, 1906.—La Coupe Aéronautique Gordon-Bennett. Une Motocyclette A. Helice (Marius Degoul). L'essor de Santos Dumont (A. de Masfrand). L'Aéroplane à Moteur de M. Vuia (T. Vuia).

ILLUSTRIERTE AËRONAUTISCHE MITTEILUNGEN (Strassburg).

July, 1906.—Von Strassburg i. E. Zum Atlantischen Ozean. Einige Landungsbilder (von Hauptmann Hinterstoisser). Die Féderation Aéronautique Internationale.

August.—Der Parsevalsche Motorballon (V. Parseval). Die Beteiligung unserer Marine an der Erforschung der Atmosphäre über den Ozeanen (H. Hergesell). Der Einfluss des Windes auf frei in der Luft fliegende Körper (W. Kress).

September.—Goethe und die Luftschiffahrt (F. M. Feldhaus). Aëronautischen Landkarten, ein Bedürfnis für Freifahrten (H. W. L. Moedebeck). Die erste Aëronautische Ausstellung in America (C. Dienstbach). Irrtümliche Auffassungen über das Flugproblem (W. Kress). Flugtechnik in England.

WIENER LUFTSCHIFFER-ZEITUNG (Vienne).

July, 1906.—Der Parseval-Ballon; Die Katastrophe der "Regina Elena"; Ballon Fahrt vom Mai 4, 1906; Der Motor Gleitfliéger von der Gebrüden Wright.

August, 1906.—Die Nordpolfahrt; Von Strassburg Zum Atlantic; Von des Gebrüdern Wegener; Die Dauerfahrt Von 52½ Stunden; Hermann Ritter von Loessl; Eine Nachtfahrt Zweier Damen.

BOLLETTINO DELLA SOCIETA AËRONAUTICA ITALIANA (Rome).

May-June, 1906.—La Stabilità degli Aéroplani secondo il Bryan ed il Cap Ferber (Ing Galletti). Profili sommari di alcune direttrici pel passaggio delle alpi (Castagneris Guido). Considerazioni di Meteorologia sul passaggio della Zona Alpina in Aérostato (P. Burgatti). Sulla determinazione degli elementi del vento. La Sezione Aéronautica All'Esposizione di Milano; L'Eclisse di sole del 30 agosto, 1905, e le esperienze di tricromia del Prof. G. Mengarini (Castagneris Guido).

Applications for Patents.

(Made in July, August, and September, 1906.)

The following list of Applications for Patents connected with Aëronautics has been specially compiled for the AËRONAUTICAL JOURNAL by Messrs. BROMHEAD & Co., Patent Agents, 33, Cannon Street, London, E.C.

JULY.

15610. July 10th. JOSEPH MALES. **Improvements in and relating to Airships.**

16250. July 18th. GEORGE EDWARD WADE. **Flying Machines.**

17106. July 30th. WILLIAM HOUSTON. **Carrier Screws for Ships, Boats, and the like; also for Aërial Vessels.**

AUGUST.

18581. August 20th. CYPRUS ARMITAGE. **Improvements in construction of the Wings of Flying Machines, or apparatus and means for, and manner of, operating the same.**

19259. August 28th. JULES CORNU and PAUL CORNU. **Improvements in or relating to Flying Machines.**

19433. August 31st. MARGARET LING BROOKE **Improvements in connection with Aëronautical Machines.**

19488. August 31st. ALFRED HARDIE. **Improvements in and relating to Flying Machines.**

SEPTEMBER.

19561. September 1st. DÉSIRÉ SIVAL. **Improvements relating to Aërial Machines.**

20904. September 20th. WALTER DAGNALL and J. E. MATTINSON. **Improvements in and relating to Airships.**

20952. September 21st. JOHN LAW GARSED. **Improvements in Aërial Machines.**

SPECIAL NOTICE.

OLD ANNUAL REPORTS OF THE AËRONAUTICAL SOCIETY OF GREAT BRITAIN.

In reply to various enquiries as to the old annual reports of the Aëronautical Society of Great Britain that are available for sale, there are a very limited number of spare copies which will be sold at 5s. per volume, and for which application should be made to the Hon. Secretary, 53, Victoria Street, Westminster, S.W.

The following are the numbers available, and their contents: —

1868, Contents.—"The Control of Balloons by Pressure," by John Heath.

"Power in Relation to Weight in Aërial Navigation," by A. Alexander, C.E.

"The Ascensional Power of Balloons and on Deductions Drawn from it," and original thoughts on "The Flight of Birds and Extant Theories of Artificial Flight by Aëroplanes and Wings," by J. Heath.

"Aëronautical Principles," by Moy.

"The Navigation of Balloons."

"Aërial Locomotion by Machinery without Gaseous Buoyancy," by W. H. Philips.

"Some Remarks on Mechanical Flight," by David Mayer.

"Report of the First Exhibition of Aëronautical Society of Great Britain, at the Crystal Palace."

1870, Contents.—"A Glance at Aëronautical Science," by W. Clarke.

"An Instrument to Measure the Relative Pressure and Velocity of the Wind," by Dr. W. Smyth.

"Remarks on Flight," by F. D. Artinsall.

"The Ptemametron," by P. Senecal.

"The Work and Constitution of the Committee for Administering the Experimental Fund of the Aëronautical Society."

"The Chalon Aërial Machine" (illustrated).

"The Angle of Impact of the Air on Surface."

"Observations upon the Relative Size of the Wings and the Weight of the Pectoral Muscles in the Vertebrated Flying Animals," by Mr. P. Harting, of Amsterdam.

"The Use of Balloons during the Siege of Paris."

1872, Contents.—"A New Machine for Measuring the Relation between the Velocity and Pressure of the Wind," by F. Wenham.

"Flight," by Head.

Lecture on "The Phenomena of Flight in the Animal Kingdom," by M. Marey, of the College of France, translated by F. J. Burnett (illustrated).

"The Trial of Dupuy de Lôme's Navigable Balloon."

"Lingfield's Aërial Screw."

1875, Contents.—"The Aërial Steamer," by Moy.

"The Death of Croce-Spinelli and Sivel," by James Glaisher.

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